REMARKS

Applicants have amended Claims 1, 8, 14, and 19, the independent claims in this application. Applicants submit that these claims, and the claims dependent therefrom, define patentably over the references, for the reasons given below.

First, Applicants note that some of the rejections have been made under 35 U.S.C. §102. A rejection under Section 102 is entirely inappropriate here, because the present invention models the spinal cord, while the patent application of Gerard deals only with a model of the spine.

The spinal cord and the spine are not the same. The spine modeled by Gerard is colloquially known as the backbone, whereas the spinal cord modeled by the present invention comprises soft nerve material, not bone. There is no teaching in Gerard pertaining to a model of the spinal cord. Therefore, the rejections under Section 102 are unwarranted.

Applicants submit further that the present invention is not analogous to, and not suggested by, the disclosure of Gerard, so that a rejection under Section 103 is also unwarranted.

The method of the present invention comprises three basic steps, namely measuring positions of a spinal cord, constructing and storing a plurality of two-dimensional graphs of cross-sections of the spinal cord, and stacking the two-dimensional graphs in locations corresponding to the measured positions.

In the present invention, the measurement comprises the step of deriving a single point corresponding to each vertebral level. In the present specification, that single point is the centroid of the cross-section of the spinal cord, but it could be virtually any other point which identifies the location of the spinal cord at a particular vertebral level.

In the present invention, the step of constructing and storing two-dimensional graphs is not done with respect to any measurements of a specific patient, but instead is based on a general structure representing known information about the nature of the spinal cord. The two-dimensional graphs are stored, preferably in a computer memory, for use in assembling the model. The only measurement taken from the patient, and used to construct the model, is the measurement of one point at each vertebral level. Each such point defines the location at which a corresponding pre-stored slice of the spinal cord will be positioned to assemble the model.

Stated another way, the two-dimensional graphs are independent of any measurement performed on the patient, but instead are structures that are believed to have general applicability. As stated on page 19 of the present specification, such a general model is believed reasonable, at least to a first approximation.

Thus, in the present invention, the two-dimensional cross-sections are pre-constructed and pre-stored, and are later stacked in locations based on measurements, to create the desired model.

The invention of Gerard is quite different from the method described above. Gerard teaches an image processing technique which provides a true picture of the spine, based on a plurality of measurements. In particular, paragraphs 4 and 5 of Gerard, cited by the Examiner, clearly indicate that Gerard needs to measure more than one point. Gerard speaks of measuring "landmarks" corresponding to the spine pedicles, and it is these pedicles

which Gerard seeks to model in constructing a replica of the spine. These landmarks are illustrated in Figure 2A of Gerard. In the example given, there are six measured points for each vertebra.

Although Gerard speaks of reconstructing a three-dimensional image from multiple two-dimensional images, Gerard does not teach storing of two-dimensional cross-sections of the spinal cord, and stacking these cross-sections solely based on measurements of a single point at each vertebral location.

Note that the method of Gerard is used to diagnose scoliosis of the spine. This means that the model generated by Gerard must be an accurate reproduction of the exact structure of the spine. Thus, the two-dimensional images that are used by Gerard to construct a three-dimensional image, must be accurate representations of the bone structure of the patient.

By contrast, the model of the present invention is assembled from previously-stored cross-sections of the spinal cord, which cross-sections are not based on observations of a particular patient, but which are assembled according to the measured positions of the spinal cord at each vertebral level. The purpose of the model of the spinal cord, made by the present invention, is to study the effects of injuries to the spinal cord, and to make intelligent inferences based on observed data, but not to form an exact and faithful image of the spinal cord. Thus, the model constructed by the present invention is a very different kind of model than that described by Gerard.

Claim 1 has been amended to emphasize the differences described above. Claim 1 now recites that the measurement of positions of the spinal cord comprises the step of deriving a single point (which could be the centroid) representing the position of the spinal cord at each vertebral level.

Claim 1 also recites that the two-dimensional graphs representing cross-sections of the spinal cord are independent of any measurement performed on the patient. Support for this limitation is found in the specification at pages 14, wherein it is explained that the two-dimensional cross-sections are of general applicability, not based on specific data pertaining to a patient. To distinguish further from Gerard, Claim 1 has also been amended to recite that the step includes both constructing and storing the two-dimensional cross-sections, to show that the cross-sections are retrieved from a stored database. The claim also recites that the cross-sections are of a "human" spinal cord, to emphasize that the cross-sections are general, and not specific to one individual.

These features added to Claim 1 are clearly not shown or suggested by Gerard. Gerard clearly teaches the construction of an accurate model using measurements of multiple points, and the two-dimensional images used to form the three-dimensional model are sufficiently accurate to use the model to diagnose scoliosis. As stated above, the present invention does not deal with a model of the kind assembled by Gerard. Therefore, Applicants submit that Claim 1 defines patentably over Gerard. The same conclusion applies to Claims 8, 14, and 19, which have been amended to contain similar limitations.

The remaining claims depend from the above-cited independent claims, and are therefore also believed allowable. The other references cited by the Examiner deal with specific limitations in some of the claims, but they

do not teach or suggest what is lacking in Gerard. Even when combined with Gerard, these references do not yield the present claimed invention.

Applicants submit that the claims, as amended, define a patentable invention. Applicants therefore request reconsideration by the Examiner and early favorable action.